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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
VALONE, THOMAS F	
ART UNIT	PAPER NUMBER
2831	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/582,546	DORFMUELLER ET AL.	
	Examiner	Art Unit	
	THOMAS F. VALONE	2831	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 October 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *9-11 and 13-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *9-11,13-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 June 2006* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because the amendments to the claims assert the existence of a "raised" dimension or thickness as best understood, as well as a "cross-section" amended feature that is completely indiscernible from the original two-dimensional drawings. Three-dimensional perspective drawings are required. Applicant is advised to employ the services of a competent patent draftsperson outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 13, 14, 15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding the amended claims 14 and 15, they have a phrase "raised pattern" that has been introduced into the claims as a new limitation which does not appear

anywhere in the instant disclosure and contradicts the figures 1, 2 submitted with the instant disclosure. The “raised pattern”, assumed to mean “above the plane of the electrode” to one of ordinary skill, cannot be discerned from the original two-dimensional drawing perspective. It is therefore required to be deleted. For examining purposes, the raised pattern is interpreted as any generic type of form or configuration. Appropriate correction is required.

Regarding the amended claim 13, it has a term “cross-section” which does not appear anywhere in the original disclosure filed with the application. Furthermore, since the drawings show only a flat, two-dimensional perspective, with no information in the specification to the contrary, it appears that the amended term “cross-section” contradicts the applicant’s invention since the disclosed electrodes (Fig. 1, 2) seem to have virtually no cross-section, to one of ordinary skill in the art. This is also consistent with the "measuring area 12” (Fig. 1, 2 and instant disclosure, p. 5, line 11) that is an area and not a volume between the electrodes. The term “cross-section” is therefore required to be deleted.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 9-11, 14, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Berger (WO 2004/097392) in view of Ishida (4,916,384) of record.

Regarding claims 9-11, 14, 17, (Berger's US equivalent 2007/0158191 application of record paragraph numbers are cited for translation clarity) Berger teaches a sensor for determining the concentration of particles in gases (US equivalent, par. 1) having at least one substrate element and a measuring area between the first and second electrodes (14, US equivalent, par. 33 and Fig. 1-4) with a voltage applied between the electrodes (Fig. 6, 7 and AC signals, US equivalent, par. 42). Berger teaches the first and second electrodes forming an interdigital comb structure (US equivalent, par. 2, 15, 33 and Fig. 1) where at least one measuring electrode has finger electrodes with varying widths (US equivalent, par. 15, Fig. 1-4). Berger further teaches varying widths as claimed, by explaining that the width or area of the comb electrodes can vary "at most" up to one-tenth of the distance between the electrodes (US equivalent, par. 15 and 35) as in claim 9. Berger further teaches a measuring electrode that has a raised pattern as best understood along the finger electrodes (12 or 13, Fig. 2-4) as in the amended claim 14. Furthermore, the thickness of how much the raised pattern of the electrodes 12, 13 is raised above the substrate 11 to one of ordinary skill can be clearly seen in Fig. 3.

Berger does not explicitly teach an asymmetric electric field being formed on the measuring area where the electrodes are not parallel to each other and the distance between them increases or decreases along the length of the electrode.

Ishida, from the same field of endeavor, teaches an asymmetric electric field in the measuring area (13, col. 4, line 3-10), for measuring soot particles (col. 1, line 57 and col. 4, line 1-15) as in claim 17, where the electrodes are not parallel to each other

and the distance between them increases or decreases along the length of the electrode (Fig. 4), as in claims 9-11. Ishida further teaches one measuring electrode (13, Fig. 4) along the side facing the other measuring electrode (12, Fig. 4).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included an asymmetric electric field where the electrodes are not parallel to each other and the distance between them increases or decreases along the length of the electrode, with a structure along the side facing the other measuring electrode as taught by Ishida, in the Berger measuring area by modifying the electrode design, for the benefit of determining the volumetric concentration of soot particles in the measuring area considering conductivity and flow rate, as suggested by Ishida (col. 3, line 50-55 and line 65-67).

6. Claims 13, 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Berger as modified by Ishida (B-I) as applied to claims 9-12, 14, 17 above, and further in view of Becker (5,858,192).

Regarding claim 13, 15, the teachings of B-I are reviewed above. B-I further teaches a measuring electrode that has a raised pattern along the finger electrodes (Berger, 12 or 13) with a clearly discernible cross section (Berger, Fig. 2-4) with a side view as normally required to show a cross section, to one of ordinary skill in the art, as in the amended claims 13, 15.

B-I does not teach measuring or finger electrodes with a triangular form or regularly arranged geometric shapes.

Becker, from the same field of endeavor, teaches measuring and a group of electrodes with a triangular form (col. 5, line 45-50 and col. 4, line 11), which is a geometric shape regularly arranged.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included a measuring or finger electrodes with a triangular geometric form regularly arranged in the B-I sensor as taught by Becker, for the benefit of creating a spatially inhomogeneous electric field distribution, as suggested by Becker (col. 5, line 55-60).

7. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Berger as modified by Ishida (B-I) as applied to claims 9-12, 14, 17 above, and further in view of Bosch (6,634,210) of record.

Regarding claim 16, the teachings of B-I are reviewed above.

B-I does not teach a central electrode between the first and second measuring electrode.

Bosch, from the same field of endeavor, teaches a central electrode (guard electrode, col. 7, line 60-65) between the first and second measuring electrode (18, 19, col. 9, line 20-25 and Fig. 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included a central electrode in the B-I sensor between the first and second measuring electrode, as taught by Bosch, for the benefit of providing a separate ground connection, as suggested by Bosch (col. 7, line 25-30).

Response to Arguments

8. Applicant's arguments filed 10/7/09 have been fully considered but they are not persuasive.

9. Regarding the argument concerning the rejection under 35 USC 112-1st, and the "face" of the measuring electrodes as well as the "raised pattern" along the finger electrodes, both phrases seems to refer to new matter that is indiscernible in the two-dimensional figures and have a lack of antecedent basis in the specification. A "face" (which is no longer claimed) to one of ordinary skill in the art refers to a flat portion or as Merriam Webster's Tenth Edition defines it, "a front, upper or outer surface" or " the front of something having two or four sides." In this case, the drawings presented with the instant application are only a silhouette so no surface, except a top surface, can be discerned. It is required that more detailed professional drawings showing a third dimension without introducing new matter will aid in furthering prosecution of this case.

10. Regarding the argument concerning the "raised pattern" limitation, this refers to amended claim language which is also lacking antecedent basis in the specification and is addressed in the Office Action: Berger clearly teaches a measuring electrode that has a raised pattern, raised above the substrate, along a finger electrode (raised pattern 12 or 13 are along finger electrodes, Fig. 2-4) as in the amended claims 14, 15, to one of ordinary skill.

11. Regarding the italicized, underlined and bold-faced argument alleging that neither Berger nor Ishida disclose a sensor for particles in gases that includes interdigitated finger electrodes of varying widths, Berger further teaches that the

electrode width can vary, up to at most one-tenth of the distance of the electrodes (US equivalent, par. 35), which literally constitutes a varying width, to one of ordinary skill, in addition to the "interdigital electrodes" taught by Berger (US equivalent, par. 15) and the comb electrodes taught by Berger (12, 13, Fig. 1).

12. The argument regarding a triangular shape to the electrode (or "triangular cross-section" as claimed) has been addressed in the Office Action in the citation of Becker (col. 5, line 45-50 and col. 4, line 11) who teaches the same triangular cross-section concept for electrodes, in the same sense as the claim. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

13. Regarding the argument that the aspect of the sensor of claim 9 is that the parallelism is minimized with an inhomogeneous region between the electrodes, this argument in favor of innovation is not found to be persuasive. The Ishida reference fulfills this requirement whose parallelism is minimized with an inhomogeneous region between the electrodes (col. 4, line 1-15 and Fig. 4).

14. Regarding the argument concerning the "raised pattern" limitation, this refers to amended claim language which is lacking antecedent basis in the specification and is addressed in the above Office Action. Berger clearly teaches a measuring electrode that has a raised pattern along a side facing the other measuring electrode (12 or 13, Fig. 2-4) as in the amended claims 14, 15.

15. Regarding the argument that Becker's electrodes "may or may not" be parallel and "may be interdigitated" (Remarks, p. 6), the test for obviousness is not whether the

features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

The rest of the arguments concern a general allegation of patentability that the secondary references do not make up the deficiencies of the primary reference, without specifically pointing out how the language of the claims patentably distinguishes them from the references.

It is suggested that if the applicant were to introduce language into the claims that has antecedent basis and is clearly found in the instant specification, e.g., "structured finger electrodes", where the "structured" term is claimed and thereby defined as being formed by regularly arranged tips, squares, dots or other geometric shapes (instant specification, p. 6, line 25-31), the application may receive a more favorable review.

Conclusion

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Frey and Nelson teach interdigital and triangular electrodes.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to THOMAS F. VALONE whose telephone number is (571)272-8896. The examiner can normally be reached on Tu-W-Th, 10:30-7:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez can be reached on 571-272-2245. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Thomas F Valone/
Examiner, Art Unit 2831

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